

ABSTRACT OF THE DISCLOSURE

The present invention relates to a reduced bleed vapor compression cycle environmental control system for an aircraft. The environmental control system provides conditioned external ram air to compartments such as the cabin, the flight deck, avionics compartment, and other equipment compartments, where conditioned air is needed. The system includes a first compressor for compressing the external ram air to cabin pressure and an evaporator for cooling the external ram air to a desired temperature. The system further includes a low-pressure water separator for removing moisture from the ram air prior to the external ram air being delivered to the compartment(s). The ram air compressor as well as a compressor for a refrigerant loop are driven by a turbine that expands a minimal amount of bleed air from an engine.